A Few Comments About the Future of Supercomputing

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Computing Trends in the Next Five Years

- Continued rapid processor performance growth following Moore's law
- Bandwidth will grow even faster
- Open software model (Linux) will become standard
- Aggregation, centralization, colocation
- Commodity products everywhere

A "Supercomputing" Center in 2006

March 22, 2001

http://sanjose.bcentral.com/sanjose/stories/2001/03/19/daily51.html

Huge server farm proposed for San Jose

What is being billed as the largest server farm in the world is heading for city approval in San Jose. If built as planned on a campus in the Alviso area of the city, the server farm would use 150 megawatts of power from the state's power grid plus 30 megawatts generated on site. …

The server farm proposed by U.S. DataPort of San Jose would cost about $1.2 billion to construct, encompassing 10 buildings on a 170 acre campus and would handle as much as 15 percent of the world's entire Internet traffic. It would take about five years to build out -- enough time company officials hope, for the state to solve the current electricity shortages.

Server farms are concentrations of computers and related equipment which handle Internet-related chores. In addition to needing power for the computers, telephone switches, routers and other equipment, they need power for air conditioning to cool the buildings.

"I used to think computer architecture was about how to organize gates and chips – not about building computer rooms"

Thomas Sterling, Salishan, 2001

Strategic Computing Complex at LANL – home of the 30 Tflop/s Q machine

Los Alamos

Strategic Computing Complex at LANL

- 303,000 gross sq. ft.
- 43,500 sq. ft. unobstructed computer room
  - Q consumes approximately half of this space
- 1 Powerwall Theater (6X4 stereo = 24 screens)
- 4 Collaboration rooms (3X2 stereo = 6 screens)
  - 2 secure, 2 open (1 of each initially)
- 2 Immersive Rooms
- Design Simulation Laboratories (200 classified, 100 unclassified)
- 200 seat auditorium

- **What we should discuss here:**
  - **Is this vision of the future of "supercomputing" good or bad for science?**
  - **If we think this is the wrong direction, then what should be done?**